

## High Density Hybrid Motors, Phase I

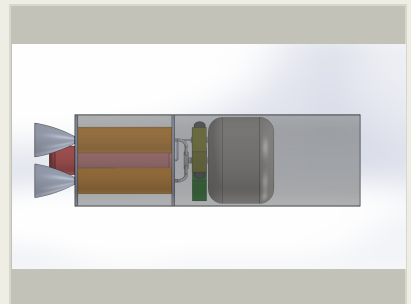
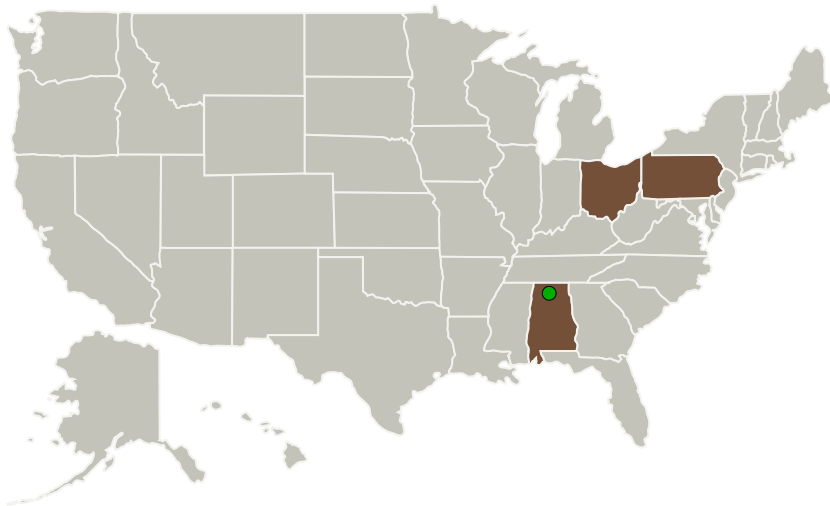
Completed Technology Project (2017 - 2018)



## Project Introduction

The Phase I STTR project will develop an ignition system for a high density hybrid rocket motor using non-toxic, storable, ionic liquid oxidizers and high density polymer fuels. The program will also research fuel additives to boost ISP and fuel regression rate of the high density, high regression rate fuel. This high density propulsion system resolves one of the chief drawbacks of hybrid rockets, the poor volumetric efficiency, by matching the volumetric performance of solid propellants. This STTR program will develop a non pyrotechnic electrocatalytic ignition system for the ionic liquid oxidizers that may also enable multistart operation.

## Primary U.S. Work Locations and Key Partners

High Density Hybrid Motors,  
Phase I Briefing Chart Image

## Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Project Transitions	2
Images	2
Organizational Responsibility	2
Project Management	2
Technology Maturity (TRL)	2
Technology Areas	3
Target Destinations	3

Organizations Performing Work	Role	Type	Location
Terves Inc.	Lead Organization	Industry	Euclid, Ohio
● Marshall Space Flight Center(MSFC)	Supporting Organization	NASA Center	Huntsville, Alabama

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## Primary U.S. Work Locations

Alabama

Ohio

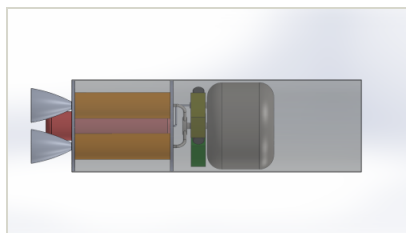
Pennsylvania

## Project Transitions

**June 2017:** Project Start**June 2018:** Closed out**Closeout Documentation:**

- Final Summary Chart(<https://techport.nasa.gov/file/140836>)

## Images

**Briefing Chart Image**

High Density Hybrid Motors, Phase I Briefing Chart Image  
(<https://techport.nasa.gov/image/134019>)

## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Organization:**

Terves Inc.

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

Carlos Torrez

**Principal Investigator:**

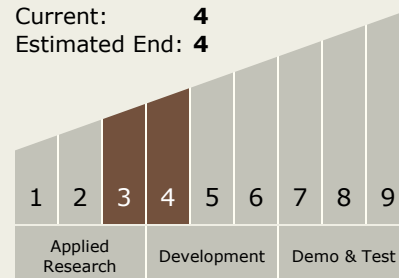
Andrew Sherman

## Technology Maturity (TRL)

Start: **3**

Current: **4**

Estimated End: **4**



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## Technology Areas

### Primary:

- TX01 Propulsion Systems
  - └ TX01.1 Chemical Space Propulsion
    - └ TX01.1.5 Hybrids

## Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System